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TRANSLATION NO. 916

DATE: July 1968

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THE SECOND ALL-UNION CONFERENCE ON THE APPLICATION OF
RADIOELECTRONICS IN BIOLOGY AND MEDICINE

- USSR -

(Following is the translation of an article by Yu. B. Mandel'tsvay in the Russian-language periodical Meditsinskaya Radiologiya (Medical Radiology), Vol 7, No. 8, Moscow, August 1962, pages 100-101)

From April 24-28, 1962 there was held in Leningrad the Second All-Union Conference on the application of radioelectronics to biology and medicine, sponsored by the Scientific Technical Society of Radio-technics and Electrosignals Imeni A. S. Popova; the Ministry of Public Health USSR; the All-Union Scientific Council on Radiophysics and Radio-technics AS USSR; the State Committee of the Council of Ministers USSR on radioelectronics; and the Academy of Medical Sciences USSR.

More than 1,000 people participated in the conference. Four plenary meetings were held at which 11 reports were made on the major problems of the application of electronics in medicine and biology; the role and future for the utilization of cybernetics, electronic microscopy, television techniques, ultra-sound, radioelectronics in physical therapy; and the development and production of electronic medical equipment in the USSR was discussed.

At 11 sectional meetings, more than 100 reports were made. One of the sections was devoted to electronic equipment in physiological research using isotopes.

G. A. Malov and N. A. Gabelova reported on the results of the study of blood flow speeds in various areas of the vascular canal in patients with acquired and hereditary heart defects, as well as in patients with vascular diseases. There were 600 people studied in all. The research was conducted with the aid of an 8-canal radiograph in the Institute of heart and Vascular Surgery. A comparison of obtained speed magnitudes of blood flow at various areas of the vascular canal with some hemodynamic indicators provides the possibility for establishing laws which do not emerge in the study of blood flow speeds through usual methods.

The report of E. Yu. El'kind and I. M. Cofman described the gamma-topograph having graph registration, developed in the All-Union Scientific Research Institute of Medical Instruments and Equipment of the Ministry of Public Health USSR (ASRIMIE), which has been approved clinically by the Institute of Neurosurgery imeni Acad. N. N. Burdenko (F. M. Lyass) and the Oncological Institute imeni P. A. Gertsena (M. A. Volkova).

S. G. Zen'kovich's report on problems of gammatopography concerned chiefly the diagnostics of brain tumors. He reported on the basic characteristics of the gammaencephalograph of the Leningrad Neurosurgical Institute imeni A. L. Polenova; briefly surveyed foreign models; and also examined the problem of the further development and refinement of the method of scintillating gammatopography.

V. A. Belvakov (ASRIMIE) discussed radiometry of biological liquids --equipment planned for the determination of urine-excreted radioactive iodine (J_{131}) and other β -active isotopes utilized therapeutically, without additional dilution and evaporation.

Yu. B. Mandel'tsbayg and I. K. Tabarovskiy (ASRIMIE) reported on the clinical scintillating equipment for the determination of thyroid function by means of J_{131} . For wider inculcation into clinical practice of this more highly approved radiodiagnostic technique, it is necessary: to supply the clinic with special radiometric equipment of high sensitivity which would secure a large output at sufficiently simple operating conditions; to secure the production of gelatin capsules with packaged amounts of J_{131} , obviating the necessity for the clinic to dole out the J_{131} solution into diagnostic portions. The development of this equipment should assist resolution of the first task. In 1962 the Council of National Economy in Kiev began a serial distribution of the diagnostic scintillating equipment type DSU-60.

V. A. Volkov and E. G. Gulyaeva (ASRIMIE) discussed equipment for the diagnosis of malignant neoplasma in body cavities with the aid of radioactive β -irradiators. A series has been developed of scintillating and gas-discharging β -probes for research into activity accumulation in cavities, tissues, and skin surfaces. β -probes permit diagnostic investigation of the vagina, cervix uteri, larynx, eyes, brain, esophagus, stomach, and skin.

The application of electroencephalography and methods of radioactive indices in the analysis of pharmacological activity of cholinolytic substances was the subject of A. M. Kats' report (Leningrad affiliate (ASRIMIE)). With the aim of studying changes in the central nervous system occurring under the influence of substances with a central cholinolytic action, research was conducted on the bioelectrical activity of the cerebral cortex in rabbits. The central cholinolytic substances used were amysil and its sulfur-containing analogue. The latter was marked S^{35} . Experiments were conducted on animals with chronically implanted platinum electrodes. Electric potentials were registered on the multi-channelled electroencephalograph ink recording. Parietal and occipital

biotics were registered. At the same time, the distribution character of the amysil sulfur-containing analogue in the animal organism was studied. Combining methods of electroencephalography and radioactive indices permitted following the finest changes occurring in the central nervous system; the control of localization and duration of their existence in the organism; and the pathways and speed of removal of the medicinal preparation. Research was conducted on many kinds of animals.

On the whole, the Second All-Union Conference on the Application of Radioelectronics to Biology and Medicine was significantly more representative than the First All-Union Conference, held in Moscow in January of 1959. This is seen even through attendance numbers (400 people in 1959) and reports presented (50 in 1959), which reflects the significant extension of the development of radio-equipment and the application of modern methods of radioelectronics in medical and biological research. Sectional meetings were very well attended, as a rule, and were very active.

However, everything said relates very little to the section on electronic equipment for physiological research with the application of radioactive isotopes. This section was listless and poorly attended. Except for the concluding report of the sectional chairman, A. F. Corodetskiy, there was no discussion of reports. Apparently the facts presented in the reports did not reflect the actual situation in the area of radiometric equipment development for medical and biological purposes. This is connected with a number of reasons. First of all, few organization of a corresponding profile were urged to attend (5 out of the 7 sectional reports were presented by the ASRIMIE). Sectional reports had differing orientations: in some the main emphasis was on purely technical and physical problems, in others -- on medical ones. They were therefore intended for differing types of audience. Since problems of a medical character (the technique of utilizing radioactive isotopes, clinical and experimental results) are chiefly discussed at all-union and republic radiological conferences, it would be advisable to concentrate the focus of subsequent conferences on the application of radioelectronics to biology and medicine on technical and physical problems in the development of radiometric equipment for medical and biological research, and the people presenting reports should be oriented accordingly. And finally, at the same time that sections were held on the indicated research, there were sectional meetings on electronic methods of research into physiological function, and sections on the application of television to biology and medicine; this led to some measure of a dissipation of effort.

There was great interest in the exhibit of new radioelectronic equipment designed for medicine and biology, held at the conference. The exhibit demonstrated more than 150 appliances and instruments (in 1959 only 90 exhibits were shown), developed and prepared by the ASRIMIE, the factory "Krasnozavdeyets", the Scientific Research Institute of Experimental Surgical Equipment and Instruments, the constructional bureau "Biofizpribor" and many other organizations.

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